



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,649	03/16/2004	Hitoshi Kitagawa	ALPSP149	3954
22434	7590	08/10/2005	EXAMINER	
BEYER WEAVER & THOMAS LLP P.O. BOX 70250 OAKLAND, CA 94612-0250			KIANNI, KAVEH C	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/802,649

Applicant(s)

KITAGAWA, HITOSHI

Examiner

Kianni C. Kaveh

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-8 is/are rejected.
- 7) ☒ Claim(s) 3 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: The specification contains formulas/acronyms such as  $\text{TiO}_2$ ,  $\text{PbMoO}_4$ ,  $\text{Ta}_2\text{O}_5$  and  $\text{SiO}_x\text{Ny}$  in at least page 9, 2<sup>nd</sup> parag. that need to be spelled out in written language. Appropriate correction is required.

### ***Allowable Subject Matter***

Claims 3 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 3 and 9 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein one of the two optical waveguides comprises a first material selected from the group consisting of  $\text{TiO}_2$ ,  $\text{PbMoO}_4$ , and  $\text{Ta}_2\text{O}_5$ , the first material having a negative refractive index temperature coefficient, and the other optical waveguide comprises a second material selected from the group consisting of lead lanthanum zirconate titanate and  $\text{SiO}_x\text{Ny}$ , the second material having a positive refractive index temperature coefficient in combination with the rest of the limitations of the base claim.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, and 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grusemann et al. ('Integrated-optical wavelength sensor with self-compensation of thermally induced phase shifts by use of a LiNbO<sub>3</sub> unbalanced Mach-zehnder interferometer'; 10/10/2002/vol. 41, no. 29/Applied Optics; pages 6211-6219).

Regarding claims 1 and 6, Grusemann et al. teaches a Mach-Zehnder interferometer temperature sensor/optical-switch (shown in at least figure 1 and/or 11) comprising:

two optical waveguides having refractive index temperature coefficients with opposite signs (see fig. 1, items waveguide arms and col. Page 6212, 1<sup>st</sup> col., 1<sup>st</sup> parag.),

the two optical waveguides being in the vicinity of each other at two locations such that two optical couplers are provided at the two locations and including respective optical waveguide arms between the two optical couplers (shown in fig. 1/11, item optical couplers at the two ends of the MZI waveguide arms); and a heater which heats at least one of the two optical waveguide arms (shown in fig. 1 and 8, item heater for generating heat/controlling the temperature of waveguide arm(s)).

However, Grusemann does not specifically state that the above couplers are of directional couplers. It is obvious/well-known to those of ordinary skill in the art when the invention was made that the above couplers in a MZI are/known-to-be as directional couplers since such couplers provide highly accurate output signals for temperature measurement (see abstract).

Regarding claims 2, 4-5, and 7-8, Grusemann further teaches wherein the heater heats both of the two optical waveguide arms (shown in fig. 8, item heater for heating both waveguide arms); wherein  $\delta/k \leq 0.2$  is satisfied, where  $\delta$  is one-half of the difference between the transmission coefficients of the two optical waveguides and  $k$  is the coupling coefficient (shown in fig. 3, item  $\delta/k$  is far less than 0.2); wherein the physical lengths of the two optical waveguides are different from each other and are set such that the effective optical path lengths of the two optical waveguides for light with a predetermined wavelength are the same in the region between the optical couplers (see at least page 6212, 1<sup>st</sup> parag. and page 6214, 1<sup>st</sup>-3<sup>rd</sup> parag.); wherein the two optical waveguide arms have the same physical length (see at least page 6214, 1<sup>st</sup>-3<sup>rd</sup> parag.).

### ***Citation of Relevant Prior Art***

Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:

Application/Control Number: 10/802,649

Page 5

Art Unit: 2883

Chen et al. 20030174955

Chen et al. 6836598

How Kee Chun et al. 20030039461

Conzone et al. 6882782 teaches at least independent claims

These references are cited herein to show the relevance of the apparatus/methods taught within these references as prior art.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872-9306 (for formal communications intended for entry)

**or:**

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.



K. Cyrus Kianni  
Primary Patent Examiner  
Group Art Unit 2883

**KAVEH KIANNI  
PRIMARY EXAMINER**

July 28, 2005